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Impact of using a racket during wheelchair badminton propulsion.

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INTRODUCTION:
Wheelchair badminton is a recent sport, and its peculiarity lies in the use of a badminton racket (BR) during wheelchair propulsion. To our knowledge, this particularity has not been studied in the field of wheelchair badminton but more widely studied in the context of wheelchair tennis, a discipline close to wheelchair badminton in which we find the same peculiarity. Prior studies found that using a racket during wheelchair propulsion have a negative impact on the performance and efficiency of wheelchair propulsion and on the risk of injury to athletes [1-3]. In view of these studies, it would be interesting to see if the use of a BR induces similar changes. The objective of our study is therefore to compare wheelchair propulsion with and without a BR to understand its impact on the performance. We hypothesized that the athletes maximum velocity, mean acceleration and mean deceleration would decrease when using BR.
METHODS:
18 French wheelchair badminton experimented players (41.4±9.3 years; 64.9±11.1kg; 169.7±13.7cm) were recruited in our study. They performed a consecutive forward (FP) and backward propulsion (BP) test for 1 min on a 3m straight line on a badminton court with and without BR. The athletes used their own wheelchairs equipped with inertial measurement units (IMU) on the wheels. These tools allowed us to collect the kinematic data on all forward and backward propulsion passages. We compare the dominant hand with and without BR.
RESULTS:
In FP, maximum velocity decreased significantly with the use of a BR (4.57 ± 0.69 m/s vs 4.68 ± 0.65 m/s). Similar results were obtained for the mean deceleration which significantly decreased while using a BR (10.19 ± 4.26 m/s2 vs 11.12 ± 4.49 m/s2). In the same way, similar results were found comparing results with and without a BR in BP: the maximum velocity was higher without the use of a BR (4.21 ± 0.54 m/s vs 4.08 ± 0.65 m/s) and it is the same for the mean deceleration (10.22 ± 4.15 m/s2 vs 9.52 ± 3.45 m/s2). In contrast, no significant differences were found for mean acceleration but it tends to decrease for both propulsion.
CONCLUSION:
Our hypothesis was partially verified since the maximum velocity and the mean deceleration decreased with the use of the BR in FP and BP without a significant decrease in the mean acceleration. But it tends to decrease. Thus, BR does have an impact on athletes and especially their performance. Future studies should focus on the risk of injury induced using BR.
References:
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Topic: **Disabilities**

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